# CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

**NABL** - Accredited Laboratory as per ISO / IEC-17025 : 2005

JAS-ANZ BSCIC ISO 9001 REGISTERED


Job No: CTCE/BBMP/KRIDL/W.No.13/BM/Sp_Wa/2017-18

10.01.2018

## TEST REEPORT ON SPECIFIC GRAVITY AND WATER ABSORPTION

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore. |
| * Agency | : | **Technical Manager (West),** KRIDL, Bangalore. |
| * Name of Work | : | Improvements to Roads and Asphalting at Shooting Bungalow road Ravindra Nagara and other roads in Mallasandra Ward No.13, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/DD/WO/142/2017-18 Dated: 21.12.2017 |
| Technical reference | : | IS : 2386( Part -3)-1963 (RA-2011) |
| * Type of Mix | : | Bituminous Macadam |
| Date of Testing | : | 10.01.2018 |

| Sl. No. | Details | Notation | Test Number | | | Mean Value |
|---|---|---|---|---|---|---|
| | | | Test 1 | Test 2 | Test 2 | |
| 1 | Weight of aggregate suspended in water with the basket | $W_1$ g | 2010 | 2012 | 2014 | |
| 2 | Weight of basket suspended in water | $W_2$ g | 750 | 750 | 750 | |
| 3 | Weight of saturated aggregate in water | $(W_1 - W_2) = W_s$ g | 1260 | 1262 | 1264 | |
| 4 | Weight of saturated surface dry aggregate in air | $W_3$ g | 2025 | 2027 | 2029 | |
| 5 | Weight of water equal to the volume of the aggregate | $(W_3 - W_S)$ g | 765 | 765 | 765 | |
| 6 | Weight of oven dried aggregate | $W_4$ g | 2016 | 2018 | 2020 | |
| 7 | Specific Gravity | $W_4/(W_3-W_S)$ | 2.635 | 2.638 | 2.641 | 2.638 |
| 8 | Apparent Specific gravity | $W_4/(W_4-W_S)$ | 2.667 | 2.669 | 2.672 | 2.669 |
| 9 | Water Absorption | $((W_3-W_4)*100)/W_4$ | 0.45% | 0.45% | 0.45% | 0.45% |

*Information is furnished by the Customer/Representative.

**Comments:**

⇒Maximum allowable Aggregate Water absorption value for Bituminous Macadam is 2.0%

**Note:**

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⇒The results indicated above are based on the tests carried out on the samples received in the laboratory.

⇒Any Query regarding the report must be reported within 30 days from the date of testing.

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Job No.: CTCE/BBMP/KRIDL/W.No.13/BM/Bitumen/2017-18 10.01.2018

## TEST REPORT ON BITUMEN CONTENT DETERMINATION OF BITUMINOUS MACADAM MIX

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore. |
| * Agency | : | **Technical Manager (West),** KRIDL, Bangalore. |
| * Name of work | : | Improvements to Roads and Asphalting at Shooting Bungalow road Ravindra Nagara and other roads in Mallasandra Ward No.13, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/DD/WO/142/2017-18 Dated: 21.12.2017 |
| * Sample ID | : | Shooting Bunglow road in Mallasandra in at ward no.13, |
| Technical Reference | : | 10.01.2018 |
| Date of Testing | : | 10.01.2018 |

### BITUMEN CONTENT DETERMINATION

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture before Test, g | 500 | 500 |
| 2. Weight of Mixture after Test, g | 482.5 | 481.5 |
| 3. Weight of Asphalt and Mineral matter Extracted, g | | - |
| 4. Weight of Mineral Matter, g. | - | - |
| 5. Weight of Ash, g | | |
| 6. Weight of Bitumen Extracted, g. (corrected) | 17.5 | 18.50 |
| 7. Bitumen content in % | 3.50 | 3.70 |
| 8. Average | 3.60 | |

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Civil-Tech Consultants & Engineers Bangalore

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10.01.2018

Job No.: CTCE/BBMP/KRIDL/W.No.13/BM/Bitumen/2017-18

## TEST REPORT ON GRADATION OF BITUMINOUS MACADAM MIX

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore. |
| * Agency | : | **Technical Manager (West),** KRIDL, Bangalore. |
| * Name of work | : | Improvements to Roads and Asphalting at Shooting Bungalow road Ravindra Nagara and other roads in Mallasandra Ward No.13, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/DD/WO/142/2017-18 Dated: 21.12.2017 |
| * Sample ID | : | Shooting Bunglow road in Mallasandra in at ward no.13, |
| Technical Reference | : | IS:2386 and IRC:SP:11-1984 |
| Date of Testing | : | 10.01.2018 |

### GRADATION AFTER EXTRACTION

| Sieve Size in mm | Trail 1 | | | | Specified Limits as per MORTH specification table 500-04 (Grading-2) |
|---|---|---|---|---|---|
| | Weight Retained, gm | % Retained | %Cummulative Retained | % Passing | |
| 26.5 | 0 | 0 | 0.00 | 100 | 100 |
| 19 | 33.45 | 6.93 | 6.93 | 93.07 | 90-100 |
| 13.2 | 80.7 | 16.73 | 23.66 | 76.34 | 56-88 |
| 4.75 | 254.8 | 52.81 | 76.47 | 23.53 | 16-36 |
| 2.36 | 55.64 | 11.53 | 88.00 | 12.00 | 4-19 |
| 0.3 | 24.86 | 5.15 | 93.15 | 6.85 | 2-10 |
| 0.075 | 6.74 | 1.40 | 94.55 | 5.45 | 0-8 |

| Sieve Size in mm | Trail 2 | | | | Specified Limits as per MORTH specification table 500-04 (Grading-2) |
|---|---|---|---|---|---|
| | Weight Retained, gm | % Retained | %Cummulative Retained | % Passing | |
| 26.5 | 0 | 0 | 0.00 | 100 | 100 |
| 19 | 31.57 | 6.56 | 6.56 | 93.44 | 90-100 |
| 13.2 | 80.41 | 16.70 | 23.26 | 76.74 | 56-88 |
| 4.75 | 256.4 | 53.25 | 76.51 | 23.49 | 16-36 |
| 2.36 | 55.14 | 11.45 | 87.96 | 12.04 | 4-19 |
| 0.3 | 30.27 | 6.29 | 94.25 | 5.75 | 2-10 |
| 0.075 | 8.41 | 1.75 | 95.99 | 4.01 | 0-8 |

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Job No: CTCE/BBMP/KRIDL/W.No.13/BM/Agg.G/2017-18

10.01.2018

## TEST REPORT ON GRADATION OF AGGREGATES

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore. |
| * Agency | : | **Technical Manager (West),** KRIDL, Bangalore. |
| * Name of work | : | Improvements to Roads and Asphalting at Shooting Bungalow road Ravindra Nagara and other roads in Mallasandra Ward No.13, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/DD/WO/142/2017-18 Dated: 21.12.2017 |
| * Sample ID | : | Hot Mix Plant, Bangalore |
| Technical Reference | : | IS : 2386( Part -1)-1963 (RA-2011) |
| * Type of Mix | : | Bituminous Macadam |
| Date of Testing | : | 10.01.2018 |

Total Weight of Sample: 5250 gm

| Sieve Size, mm | Weight Retained, gm | % Retained | Cummulative % Retained | % Passing | Grade-II As per MORTH | Remarks |
|---|---|---|---|---|---|---|
| 26.5 | 0 | 0 | 0 | 100 | 100 | Gradation satisfies Grade-II MORTH Table 500-4 specification |
| 19 | 365 | 6.95 | 6.95 | 93.05 | 90-100 | |
| 13.2 | 1680 | 32.00 | 38.95 | 61.05 | 56-88 | |
| 4.75 | 1485 | 28.29 | 67.24 | 32.76 | 16-36 | |
| 2.36 | 1125 | 21.43 | 88.67 | 11.33 | 4-19 | |
| 0.3 | 250 | 4.76 | 93.43 | 6.57 | 2-10 | |
| 0.075 | 95 | 1.81 | 95.24 | 4.76 | 0-8 | |

Total Weight of Sample: 5150 gm

| Sieve Size, mm | Weight Retained, gm | % Retained | Cummulative % Retained | % Passing | Grade-II As per MORTH | Remarks |
|---|---|---|---|---|---|---|
| 26.5 | [illegible] | 0 | 0 | 100 | 100 | Gradation satisfies Grade-II MORTH Table 500-4 specification |
| 19 | [illegible] 415 [illegible] | 8.06 | 8.06 | 91.94 | 90-100 | |
| 13.2 | [illegible] 1585 [illegible] | 30.78 | 38.83 | 61.17 | 56-88 | |
| 4.75 | [illegible] 1670 [illegible] | 32.43 | 71.26 | 28.74 | 16-36 | |
| 2.36 | 945 | 18.35 | 89.61 | 10.39 | 4-19 | |
| 0.3 | 380 | 7.38 | 96.99 | 3.01 | 2-10 | |
| 0.075 | 100 | 1.94 | 98.93 | 1.07 | 0-8 | |

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**NABL** - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377


Job No.: CTCE/BBMP/KRIDL/W.No.13/CSR-01/537/QB(BC)/2017-18 09.01.2018

## TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore. |
| * Agency | : | **Technical Manager (West),** KRIDL, Bangalore. |
| * Name of work | : | Improvements to Roads and Asphalting at Shooting Bungalow road Ravindra Nagara and other roads in Mallasandra Ward No.13, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/DD/WO/142/2017-18 Dated: 21.12.2017 |
| * Sample ID | : | Bitumen |
| Source/ Location | : | Hot Mix Plant, Bangalore. |
| Sample Received on | : | 07.01.2018 |
| Period of Testing | : | 09.01.2018 |

The results of the tests conducted on the bitumen sample are as follows:

| Sl. No | Description | Test Method as per IS | Test Result | Requirement as per IS:73:2013 |
|---|---|---|---|---|
| 1 | Penetration at 25 $^0$C, 1/10 mm | IS :1203 -1978 (RA-2014) | 67 | 60 to 70 |
| 2 | Softening point, $^0$C | IS :1205 -1978 (RA-2014) | 46 | Min. 45 |
| 3 | Ductility at 27$^0$C, cm | IS :1208 -1978 (RA-2014) | 100 > | Min.50 |
| 4 | Flash Point, $^0$C | IS :1209 -1978 (RA-2014) | 299 | Min. 220 |

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